REMARKS

Petition for Extension of Time Under 37 CFR 1.136(a)

It is hereby requested that the term to respond to the Examiner's Action of May 17, 2007 be extended three months, from August 17, 2007 to November 19, 2007 (November 17 being a Saturday).

Authorization to charge a Credit Card is given to cover the extension fee. The Commissioner is hereby authorized to charge any additional fees associated with this communication to Deposit Account No. 19-5425.

In the Office Action, the Examiner indicated that claims 1 through 34 are pending in the application, that claims 1-7 and 9-34 are rejected, and that claim 8 is objected to.

Allowable Subject Matter

On page 16 of the Office Action, the Examiner indicated that claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for this indication of allowable subject matter.

Objections to the Claims

On page 2 of the Office Action, the Examiner made various objections to the claims. Applicant has amended the claims in accordance with the Examiner's suggestions and believes the claim objections have been overcome.

Claim Rejections, 35 U.S.C. §§102 and 103

On page 3 of the Office Action, the Examiner rejected claims 1-5, 9-11, 23, 25-27, 30-32, and 34 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,847,755 to Morrison.

On page 8 of the Office Action, the Examiner has rejected claims 6-7, 24, 28-29, and 33 under 35 U.S.C. §103(a) as being unpatentable over Morrison. On page 12 of the Office Action, the Examiner has rejected claims 12-18 under 35 U.S.C. §103(a) as being unpatentable over Morrison in view of U.S. Patent No. 6,289,442 to Asato. On page 14 of the Office Action, the Examiner has rejected claims 19-21 under 35 U.S.C. §103(a) as being unpatentable over Morrison in view of U.S. Patent No. 7,055,021 to Kadambi. Finally, on page 15 of the Office Action, the Examiner has rejected claim 22 under 35 U.S.C. § 103(a) as being unpatentable over Morrison in view of Kadambi and further in view of U.S. Patent No. 5,193,180 to Hastings.

The Examiner's reliance on Morrison to reject the claims is based on the incorrect analogizing of the claimed "strand numbering" to the "instruction numbering" of Morrison. For instance, the examiner draws an equivalence between the claimed strand numbering and the instruction numbering of Table 5 in column 12 of Morrison. However, they are not the same; Morrison's numbering is of individual instructions *within* each basic block whereas the strand number is a number of multiple instructions *across* basic blocks. Thus, with the present claimed invention multiple instructions (typically within the same basic block) can be given the same strand number, whereas in Morrison's approach each individual instruction is given a different number. This is a key difference as the claimed strand approach provides a mechanism to label

multiple instructions with a common conditionality or predicate status. This is neither taught nor suggested by Morrison.

The Examiner also states that operations in Morrison may be performed out of order with respect to their numbering. This is indeed the case, but in Morrison this corresponds to out of order instruction execution *within* a basic block. In the present claimed invention (since strand numbers are typically associated with different basic blocks) this corresponds to out of order issue both within *and across* basic blocks. In particular, Morrison, column 20, lines 15-25, describes how instructions in different basic blocks are specifically labeled with disjoint numbers so that there is no mixing of instructions across the basic blocks. The strand numbering of the present claimed invention specifically, and advantageously, allows mixing of instructions across basic blocks, as it enables parallelism to be exploited over a wider program scope.

The Examiner also states that instruction I5 from column 8, Table 1 is a branch that is used to determine the completion status for subsequent instructions. However this is not due to a predication state associated with the strand number (as claimed in the present invention) but because the subsequent instructions from the repeated basic block are not fetched if the branch is not taken. In other words, this approach of Morrison is a well known prior art control-based mechanism. The strand mechanism of the claimed invention is a data flow predication mechanism that associates a single predicate status with a previously labeled set of instructions sharing the same strand number. This is advantageous as it allows instructions from different strands (and thus basic blocks) to be mixed freely in the instruction schedule. For instance, if the loop of the Morrison example contained a conditionally executed instruction, then this would

break the loop into multiple basic blocks. Instructions from the next basic block cannot be

executed until the branch is resolved and all instructions from the previous basic block are

completed (as discussed in the BEU delay mechanism of Column 13, lines 7 - 42). No

parallelism exists between the basic blocks.

In the approach of the present invention, by way of contrast, instructions with a strand

number for the conditional basic block can be freely scheduled in time as long as the final

predicate status for the strand is calculated prior to the execution of any instruction from the

conditional strand that affects the final machine state. This capability greatly increases the scope

for parallel instruction execution, and cannot be achieved by Morrison.

Independent claim 1 includes specific recitation of the strand numbering and other

elements stated above that are not taught or suggested by Morrison. Thus, each of the dependent

claims are patentable over Morrison for the same reasons as set forth above with respect to claim

1. Further, the remaining references cited by the examiner also fail to teach or suggests the

limitations missing from Morrison. As such, the claims patentably define over all of the cited

references, taken alone or in combination. Accordingly, the Examiner is respectfully requested

to reconsider and withdraw the rejection of the claims under 35 U.S.C. §§102 and 103.

Conclusion

In view of the foregoing amendments and remarks, applicant respectfully requests entry

of the amendments, favorable reconsideration of the application, withdrawal of all rejections and

objections and that claims 1 - 34 be allowed at an early date and the patent allowed to issue.

Included herein is a Petition for extension of time to respond to the Examiner's Action,

and authorization to charge the extension fee to a credit card. The Commissioner is hereby

authorized to charge any additional fees or credit any overpayment associated with this

communication to Deposit Account No. 19-5425.

Respectfully submitted

 November 19, 2007_____   __/Mark D. Simpson/_____
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